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ABSTRACT

With assumptions in mind that the environment has emerged as a legitimate concern of our nation's schools, and that environmental education is interdisciplinary, the Maryland State Department of Education held a meeting for representatives from various parts of the country concerning the possibility of connecting education and the environment. Teams of specialists from eight states met for 3 days with consultants from the National Science Foundation, the Office of Education, and the National Education Association. Before the conference began each state submitted a brief report of what it had done concerning environmental education. During the sessions participants were asked to respond to 3 major objectives by identifying: 1) the contribution of subject areas to a comprehensive program of environmental education; 2) the contribution of interrelated approaches to environmental education; and 3) new strategies of implementation and sources of funding for comprehensive environmental education programs. Responses to these objectives constitute the bulk of the report. Abbreviated versions of each state's report, and a list of conference participants are included. (Author/OPH)

Education and the Environment

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Education and the Environment

Report of a Multi-state Conference

November 8-10, 1971 / Annapolis, Maryland

Sponsored by the Maryland State Department of Education

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Introduction

Preparing the Conference

If we assume that the environment has emerged as a legitimate concern of the nation's schools, and that environmental education, by its nature, is interdisciplinary, then calling together specialists in the sciences, the social sciences, and the arts and humanities to connect education and the environment is a logical course of action. With these assumptions in mind, the Maryland State Department of Education, supported by the National Science Foundation, convened a meeting for representatives of various disciplines from a cross section of the country in November 1971, at Annapolis, Maryland. Eight states — Connecticut, Maryland, Virginia, and Georgia from the East and South; Missouri and Wisconsin from the Midwest; Utah from the Southwest; and Oregon from the Northwest — agreed to participate.

The idea for the Annapolis Conference emerged from a previous, highly successful conference on environmental education conducted by the Council of State Science Supervisors, Portland State University, and the Oregon State Department of Education in May 1970. That conference included science supervisors from each of the 50 states, and its primary purpose was to draft guidelines which these supervisors could use in developing programs related to environmental education. One of the more striking conclusions of the state science supervisors was that environmental education could not be restricted to science education. Rather, they recommended that teaching the environment required an interdisciplinary approach, and that creating or altering perceptions, attitudes, and values about the environment would be critical in any program of environmental education.

The participants at the Portland Conference further suggested that state education agencies should play a major role in encouraging, developing, and implementing environmental education programs.

During the same period, that is, 1970-71, other action on the environment was being taken by people in education. The U.S. Office of Education established an office in 1970 expressly assigned with the responsibility of supporting environmental education, and limited funds were appropriated to sustain local projects. Meanwhile most states had proceeded on their own to organize task forces or advisory committees to plan for environmental education. What was missing was a combined effort to identify strategies for implementing comprehensive programs as well as ways to seek and use efficiently funds from local, state, and federal sources for implementation. The Annapolis Conference was called to deal in part with that challenge.

At Annapolis, teams of three specialists from each of the eight states — people with recognized expertise in the sciences, social sciences, and arts and humanities — met for three days. Consultants from the National Science Foundation, the U.S. Office of Education, and the National Education Association joined them. (A full list of participants, including guests, can be found on the inside back cover.) Before the conference began, each state submitted a report indicating what it had done and what it was planning to do in environmental education. (See the Appendix for a brief summary of those reports.)

The action of the conference was in the continuing dialogue of the group sessions. Participants were asked to respond before and during the conference to three major objectives:

To identify the contribution of subject areas to a comprehensive program of environmental education;

To identify the contribution of interrelated, interdisciplinary approaches to environmental education;

To identify new strategies of implementation and sources of funding for comprehensive environmental education programs.

The responses of the conference participants to these objectives constitute, of course, the bulk of the following pages.

A final objective of the Annapolis Conference was to disseminate a Report of its findings and recommendations so that educators throughout the country would become aware of the planning and programming now evolving in environmental education. It is not too much to say that in linking environment and education we are seeking to help save the one through creative use of the other. In the last quarter of the 20th century, could there be a more important task than that?

Major Findings and Recommendations

The objectives of the Annapolis Conference were threefold:

1. To identify the contribution of subject areas to a comprehensive program of environmental education;
2. To identify the contribution of interrelated, interdisciplinary approaches to environmental education;
3. To identify new strategies of implementation and sources of funding for environmental education programs.

Participants at the Conference generally agreed that:

Environmental education be given high priority by the states;

Such programs develop on a continuum from K-12 and into the colleges and universities, involving the community at all levels;

Traditional subject areas have much to contribute to environmental education;

Because environmental education connects many subjects, it demands an interdisciplinary approach;

Broad funding for programs is necessary, and should come not only from federal, state, and local governments but from foundation grants and the private sector of the economy as well.

Beyond those highlights, the conferees proposed many specific recommendations, a few of which are listed below:

Subject Area Contributions

1. Science education programs must be presented so that they teach the processes necessary to perceive the components and structure of the physical and biological environments.
2. Science should teach students that the natural systems of the earth are ongoing, interrelated series of orderly phenomena.
3. The social sciences must provide the vehicle for, and analysis of, social interaction as a means to recognize and capitalize upon man's potential to improve his environment now and in the future.
4. Social science curricula must be restructured to allow for survey and in-depth study of different ecocultural environments.
5. The arts and humanities must provide those learning experiences which involve the individual with the spatial, temporal, aesthetic, cultural, and spiritual concepts that deal with man's developing sense of order.
6. The arts and humanities should establish in the individual positive self-concepts as part of his relationship to the environment so that he might bring about constructive environmental change.

Interdisciplinary Approaches

1. Instructional activities must involve a common philosophical approach to interdisciplinary strategies.
2. Teacher education must be geared toward integrated interdisciplinary philosophy and strategies. Teachers' preservice and inservice workshops must be geared to organization for learning rather than content organizations.
3. Instructional materials, including textbooks, must reflect interdisciplinary approaches.

Strategies of Implementation

1. Full and adequate funding must be provided for Public Law 91-516-(federal) Environmental Education Act.
2. State and local school budgets should allocate funds for integrating environmental education into the curriculum.
3. There must be increased involvement of foundations, societies, and industry in support of environmental education.

I. Subject Approaches to Environmental Education

While it may be highly desirable and ultimately necessary to develop a comprehensive program of environmental education through interdisciplinary studies, such an approach will only be as strong as the individual subjects which are its components. That explains the make-up of the teams of specialists who participated in the Annapolis Conference — representatives of the sciences, social sciences, and arts and humanities. It also explains the rationale for one of the Conference's key objectives; namely, to identify the contribution of traditional subject areas to an environmental education program. Each of the subject areas responded to the objective in two ways: first, each indicated *why* environmental education required its particular knowledge and methodology; and second, each discipline recommended *how* it could best organize its contribution.

Science

Assumptions

Science education develops the skills and processes which enable the student to perceive the components and structure of the physical and biological environment. Such skills include observing, measuring, classifying, interpreting, predicting, and controlling variables.

Science education helps students to know and understand the various components which constitute the biological and physical environment, the interrelationships that exist between these components, and the conceptual models that man develops to assist him in interpreting and understanding the environment. Ultimately such an understanding enables man to relate harmoniously to the world in which he lives.

Science education contributes to the development of attitudes and values which affect man's awareness, decisions, and actions determining the present and future conditions of his environment.

Recommendations

1. Science education programs must be presented so that they teach the processes necessary to perceive the components and structure of the physical and biological environment.

   Students must be taught such processes as observing, measuring, classifying, interpreting, inferring, predicting, and controlling variables.

   One way these processes are acquired is through life-related activities in the environment.

   These processes should be introduced the very first day the child enters school, and should be developed in an appropriate manner at each grade level.

2. Students must learn through science that the natural systems of the earth are an ongoing, interrelated series of orderly phenomena.

   They should be taught that man is a part of these ongoing, orderly natural phenomena.

   They need to study the conditions necessary to support life.

   They should investigate the interrelationship of Man to his physical and biological environment. They should study the cyclic aspects of matter and energy, behavioral patterns and similarities, and interdependencies of organisms.

   They should be taught that the earth is a finite environment and must be maintained for successful human existence.

   They need to investigate the interrelationships between limited resources, population size, and resource management.

3. Science programs must be presented so as to teach ways of observing changes in the natural system, of observing the correlation of causes and effects, and of learning to predict future occurrences.

   Students need to understand how natural forces over long periods of time have altered the environment and how these forces are continuously operative.

   Students need to grasp man's powerful impact or natural processes. This impact should be investigated as a "planned action" and as an "action that occurs without planning."

4. Science education programs must be organized so that they contribute to the establishment of values which relate to the environment.

   It can be demonstrated that the outputs of science are creative products of the human mind and as such are an intrinsic part of our total culture.

   The laws of science are invented by man and thus have qualities reflecting the frailties of human endeavors and are never absolute.

   Science is but one component of the human effort which contributes to the maintenance of environmental quality.

   Science encourages students to value the extraordinary in natural phenomena.

   Science encourages students to have a reverence for the natural, both living and non-living, that can at least match their reverence for the man-made.

   The decisions to which scientific findings and information are applied are a function of the total society and not the scientific community.

   Science teaches the value of intellectual honesty and encourages its transfer to all study and decision-making.

Social Sciences

Assumptions

The health and welfare of man, both as an individual and as a society, demands that "environmental literacy" be the ultimate goals of an interdisciplinary approach to environmental education. Children must learn that the ecosystem is a social arrangement as well as a natural arrangement of the environment. This complex system is composed of all facets of the environment including man himself, interacting with and on each other. This arrangement must be understood as a result of natural and human causes in relation to each other.

In environmental education, the social sciences serve as the ethical structure that equips students with skills, facts, and attitudes which will enable them to act for the continuing improvement of their ecosphere today and tomorrow.

Social sciences can increase our awareness, appreciation, and understanding that:

This area of education involves philosophical and personal decisions to make an assessment of individual and social priorities, of immediate and long range needs and consequences, and of the claims on our resources for those living today and for posterity.

The restoring of the ecosystem is a complex undertaking deeply rooted in economic, social, and political issues. The responsibility for preparing people to make judgments that are rational is the ultimate aim of education.

The environmental crisis is controversial from a social, political, and economic point of view. Students need to know how to weigh information that is controversial if reasoned decisions are to be made. The study of the relationships between man and his environment both natural and man-made will help us to understand the consequences of our actions.

There is need to assess individual group priorities, immediate and long range needs, and the consequences resulting from the use of natural resources for those living today and in the years to come.

Man has been disruptive to his environment because of his ability to overcome it and his selfishness in sacrificing it for his own individual gain.

Man must act through societal processes to remedy his environmental errors and prevent future occurrences.

The resources of this planet are limited and there is need to allocate those resources for the maximum benefit of all.

Man's activities are determined by his attitudes; therefore, an environmental education conscience must begin in the minds of men and in education through social science as a key.

Recommendations

1. In environmental education, the social sciences must serve as the vehicle for an analysis of social interaction as a means to:

   Recognize and capitalize upon man's potential to improve his environment now and in the future;

   Analyze the cultural factors that determine the values which people have placed on their institutions, their beliefs and attitudes, and their life styles;

   Realize that the resources of this planet are limited and that there is a need to allocate those resources for the maximum benefit of all living creatures;

   Evaluate the causes and effects of social changes as they relate to man's use of the environment.

2. In environmental education, the organization of social science curricula must be restructured to:

   Delineate the essential concepts, generalizations, skills, and theories at the approximate maturity levels; Arrange these in sequential complexity for spiraling but not needless repetition;

   Show their application and integration into topics and lessons;

   Allow for survey and in-depth study of different ecocultural environments which may be:

   Near or far
   Past, present, or future
   Real or hypothetical
   Compatible or incompatible
   Component or whole.

3. In a cooperative effort with professional, regional, state and local education agencies, develop guidelines and sample activities for an environmental education program that is operable at all maturity levels.

   Keep the program interdisciplinary in nature and keyed to the objectives established.

   Draw upon community resources continuously — both people and places in and out of school.

   Develop a program for public awareness, involvement, and support.

   Provide real-life educational learning experiences that will bring the student in contact with his environment in meaningful ways.

   Have access to a wide variety of media which will complement ongoing programs.

   Recognize the interdisciplinary nature of environmental education and cooperate fully with other disciplines to enrich the educational offering.

Arts and Humanities

Assumptions

The arts and humanities must be included as an integral part of any comprehensive environmental education program.

The arts and humanities develop in the individual a sense of the aesthetic order and forming principles in the environment and their effect on man's relationship to the environment.

The arts and humanities develop in the individual an understanding of man as an organizer of experiences in the environment.

The arts and humanities develop in the individual systems of values and appreciations and offer avenues for creative, expressive behavior.

Recommendations

1. The arts and humanities must provide those learning experiences which involve the individual with the spatial, temporal, aesthetic, cultural, and spiritual concepts that deal with man's developing sense of order.

Experiences in the arts appropriate to each individual should be offered on a K-12 continuum that progressively develops the individual's ability to see and respond to the environment through education of the sense of vision, hearing, touch, smell, taste, and movement.

The development of the individual's expressive behavior in the arts acquaints him with the available symbols of an art form and teaches him that forms carry expressive meaning.

Experiences in the arts progressively develop the individual's concept and perception of form through problems of practice and criticism that permit an interaction between himself and the natural, the expressively symbolic, and the functionally manufactured objects and events of his environment.

Continuing experiences in the arts develop a facility for learning a communicable grammar or language of the arts.

Experiences in using verbal language enable the individual to organize and express his experiences with the environment.

Experiences in literature, including drama, develop the individual's sense of the archtypes of literature (recurring images, metaphors, patterns, stories) and their relationships with the environment.

The individual's expressive behavior should be developed in a variety of expressive modes; e.g., verbalizing, singing, dancing and body movements, rhythm sounds, story telling, role playing, dramatizations, miming, drawing, painting, forming, shaping, and constructing with appropriate materials.

Experiences through the arts in environmental education should allow for the experimental and exploratory. There should be opportunities for responding to the spontaneous and a searching out for what is considered fresh and expressive by improvisation and a casual creativity.

Appropriate cues for methodology in the arts in environmental education should be sought in the practices of the artist and the critic's or scholar's dialogue with phenomena and feeling.

2. The arts and humanities must establish in the individual positive self-concepts as part of his relationship to the environment so that he might bring about constructive environmental change.

   Experiences in the arts related to environmental education provide for pupil-centered activities and, are subjective in nature, stressing the role of the emotions and accenting the senses.

   Arts curricula in environmental education seek to make those connections to life that relate to the making and seeing of art and those conditions in the total environment which shape art and which it shapes in turn.

   Experiences in the arts transmit a cultural heritage and develop a sense of tradition that may be validated, altered, or rejected as a contemporary responsibility of the individual in developing an environmental ethic to guide his behavior.

   Experiences in the arts develop in the individual those creative abilities and attitudes which encourage him to question issues and solve environmental problems in a creative manner.

3. The arts and humanities must develop in the individual a responsible commitment to make the aesthetic value judgments of an ecologically informed individual toward preserving and enriching man's interaction with his environment.

   Continuing experiences in the arts develop the student's sense of responsibility for a process of change that possesses aesthetic as well as ethically based considerations.

   Experiences in the arts and the humanities integrate the relevant aspects of those disciplines which explore such focal considerations as myth, religion, history of language, cultural mores, social groupings, architecture, landscape architecture, city planning, and historical precedent as they relate to man's interaction with his environment.

   Continuing experiences in the arts offer the individual opportunities to indicate a growing aesthetic sensibility and consciously ethical understanding of the relationship of the arts to the environment

   Experiences in the arts offer authentic, artistic, or aesthetic clues that develop an increasingly discriminating assessment of the intrinsic worth and expressive merit of the objects, events, and conditions of the environment.

II. Interdisciplinary Approaches to Environmental Education

Until rather recently the environment was thought to be the proper concern of environmentalists, conservationists, and ecologists. The consequences of such a narrow perspective was a narrow approach to the enormously complicated relationships between man and the world he inhabits. Now that is changing. One of the main thrusts of the Annapolis Conference was to determine in what ways interdisciplinary approaches could be employed to study and teach the intricate connections between environment and man. For instance, how is it possible to relate the arts and the humanities to the natural sciences, and both to the environment?

As one participant in the Conference argued: "Environmental education offers an excellent means for the development of a more integrated and more functional curriculum. . . . Environmental problems are something the student encounters each day. . . . If we accept the statement that students learn by doing, then the environment provides that opportunity. . . . We're not talking about a single course . . . (but an) educational process . . . we need a foundation of insight into the relationship man has with other living things on this planet . . . ."

Or, as the teams of specialists from the various disciplines concluded: "Just as man's environment permeates his entire life, environmental education must permeate his entire learning experience. The goals of environmental education then become the goals of general education." Out of the interaction of the sciences, social sciences, arts and humanities should come an "environmental ethic," that is, a proper sense not only of man's relationship to man but to his total environment. In preparing individuals to make decisions and to take appropriate actions concerning their environment, "education must develop in the individual a positive self-concept" and a concomitant sense of responsibility for other life.

Recognizing that environmental education comprehends broadly the arts and the sciences, the following components can be identified:

Perceptual Awareness — developing knowledge and emotional responses as a result of perceptual experiences involving the senses.

Conceptual Awareness — organizing learning experiences around the concepts of the environment — diversity, organization, interaction and interdependence, continuity, change and adoption, and evolution.

Aesthetic Valuing and Discriminating — making aesthetic judgments involving personal values related to order, harmony, fulfillment, beauty, and concern for the integrity of all things in the environment.

Creative Abilities — encouraging the individual to question issues, to be open to change, and to be capable of solving environmental problems in an imaginative manner.

Humanistic Attitudes — developing a concern for the dignity and integrity of man as a result of examining values, attitudes, and behavior of the past and present; developing humanistic attitudes and behavior in a learning environment which respects the individual.

The Phenomena of the Natural Environment — understanding the biological and physical aspects of the natural environment and recognizing the potential and limitations; deriving inspiration and direction from this knowledge which will influence the kind of intrusion or response considered appropriate to maintain the integrity of the natural environment.

Organizational Skills and Knowledge — collecting and using data from the environment in a systematic way that enhances environmental maintenance.

Decision-making — applying knowledge, skills, processes, and values embodied in the arts, sciences, and social sciences toward the resolution of environmental problems and issues.

Recommendations

1. Instructional activities must involve a common philosophical approach to interdisciplinary strategies.
2. Teacher education must be geared toward integrated interdisciplinary philosophy and strategies. Teachers' preservice and inservice workshops must be geared to organization for learning rather than content organization.
3. Flexibility must be written into school programs, scheduling, and classroom organization.
4. School classrooms themselves — the school buildings and their sites as well — must be recognized as part of the educative process.
5. Ongoing evaluation must be based on stated program goals. Competencies, rather than course length, must be recognized and given greater value.
6. Natural relationships must be sought out in interdisciplinary instruction.
7. Content and process of environmental education must be described so that input of the disciplines can be seen as interrelated. Content and process models that are interdisciplinary must be developed for environmental education. Pilot models in environmental education will need to be evaluated.
8. Instructional materials, including textbooks, must reflect interdisciplinary processes.
9. Students, community groups, and agencies outside education must be represented in planning, implementing, and evaluating dedicated programs in environmental education.
10. Teachers must acquire competency in facilitating a total environmental education by:
    a. Engaging in interdisciplinary team teaching;
    b. Directing their classes so as to illustrate, reinforce, extend, and apply the skills, facts, and attitudes of the other disciplines;
    c. Visiting, observing, and participating as a learner in the classes of other subjects for familiarization with other educative environments.

III. Strategies of Implementation

The final objective of the Annapolis Conference was to identify new sources of funding and new strategies of implementation required to initiate comprehensive State environmental education programs. A few participants believed that little or no support should be sought or expected from the federal government. The majority, however, realized that full funding of a massive new program was very likely beyond the capacity of state and, certainly, of local governments. The needs, observations, and recommendations listed below are not inclusive; but they do represent the consensus of the Conference in this critical area. It should be noted that a number of strategies for implementing programs are included in the recommendations of the previous two chapters.

Needs

In the implementation of an environmental education program that is interdisciplinary in nature, the following needs for funding that are beyond the financial capability of individual states must be considered. (Some of these may only require involvement and not funding.)

1. *Preservice and inservice training of teachers*
2. *Funded workshops for the development of in-life curricula related to the environment*
3. *Development of instructional media for environmental education*
4. *Needs assessment studies conducted in some localities*
5. *Development of public relations materials and plans to involve private agencies concerned with environmental problems*
6. *Supplemental or enrichment programs through community resources and the expertise of their people; e.g., local, state and federal people*
7. *Establishment of camps and other in-residence experiences with the environment (live-in camps and nature trails)*
8. *Establishment of regional centers nationally or statewide for the instruction of teachers at various levels.*

Assumptions

1. The interpretation and administration of the current Environmental Education Act (P.L. 91-516) does not adequately support the implementation of comprehensive state programs of environmental education.

   The total funding, if equally distributed to each state, is totally inadequate.

   The Office of Environmental Education is so understaffed that it is unable to administer the Act in an effective manner.

   The Act and its interpretation given by the U. S. Office of Education staff fail to recognize the role and responsibility of every state for providing programs of education. The U. S. Office of Education has given a low priority to environmental education.

2. During the past two years, state education agencies and local school districts demonstrated a growing interest in environmental education.

   Most state education agencies have initiated some planning activities in environmental education.

   Some local schools and school districts have initiated limited pilot programs or classes in environmental education.

   In some states, the legislatures and state agencies have worked closely with the education agency in planning programs of environmental education.

3. State education agencies and local school districts have not provided the funding necessary to implement comprehensive programs of environmental education.

   Local and state agencies tend to rely on the federal government for funding of new educational programs.

   Conflicting interest groups within states tend to deter state funding of environmental education programs. State school systems have not considered environmental education a high enough priority to include in their budgeting funds for integrating environmental education into the curriculum.

4. The involvement of public and private foundations, professional societies, and industrial groups in environmental education has been limited and fragmented.

5. Teacher education programs have not awakened to the needs of environmental education.

Recommendations

1. *Full funding must be provided for PL 91-516, the existing environmental education act.*

2. *The U.S.O.E. must take all steps necessary to implement fully the intent of the Environmental Education Act PL 91-516 by:*

   Providing adequate staff and facilities;

   Modifying the guidelines so that the Act supports the efforts of states to provide their own environmental education programs;

   Establishing environmental education as an area of high educational priority for the decade of the seventies for the U.S.O.E.;

   Devising ways of bringing together academic specialists of the O.E. staff to support multi-disciplinary strategies of environmental education;

   Redirecting funds currently available to the U.S.O.E. to support environmental education in the states.

3. *Federal legislation must be developed which would, in a more realistic manner, provide state department of education funds for developing and implementing comprehensive state programs of environmental education.*

4. *State and local school budgets must allocate funds for integrating environmental education into the curriculum.*

   States should fund activities of curricular modification, teacher inservice, pilot projects, and evaluation.

   Local educational agencies should fund activities of implementation.

5. *There must be increased involvement of foundations, societies, and industry in support of environmental education.*

   The National Science Foundation and the National Endowment for the Arts should be given authority and corresponding funds to increase their involvement in supporting environmental education.

   The government foundations should provide leadership in bringing the resources of industry and professional societies together in support of environmental education.

6. *Colleges and universities must become involved in the preservice and inservice education of teachers to provide a professional staff to local school districts responsive to environmental educational needs.*

Appendix

State Progress Reports

As essential background material for the Conference each state compiled a cogent statement of what had been happening, and of what was likely to happen, in environmental education at the state level. Because of space limitations, only portions of these reports have been excerpted. Even in their truncated form, however, they provide an idea of the range and scope of activities the participating states are currently engaged in. Copies of the complete reports are available at the respective departments of education.

Connecticut

The state of Connecticut has been concerned with environmental education for a number of years. Since the environmental education concept touches many subject matter areas, efforts have been made beyond the disciplines of social studies and science, the two areas in which most of the environmental education thrust has been placed. The current definition of *environmental education* includes a number of terms often used in the past and, to a considerable extent, still in use today; for example, conservation education and outdoor education. The broader definition used in Connecticut today is "Environmental education is concerned with the interrelationships between man and his physical, biological, and cultural surroundings."

A number of curriculum bulletins issued by the Department of Education make reference to aspects of environmental education. The "Science Education Grades 7-12" curriculum bulletin issued in 1958 indicates that conservation is an important aspect of the junior high school science curriculum. In earth science, attention is given to study of Connecticut's weather and climate, the patterns of erosion along the shore, geology, and oceanography. In biology, some of the suggested topics for study are the relation of living things to the physical environment, the interrelationships among living things, and conservation.

State Department of Education publications in the social studies also include concepts impinging on the area of environmental education. Some of the objectives stated in the "Social Studies — Grades 7-12" (1965) bulletin are to understand the relation of the physical environment to the life and culture of a people; to understand the kinds of resources essential in an industrial civilization as contrasted with an agricultural civilization; to understand how invention, science, and technology have given new values to certain resources and lessened man's dependence on other resources; and to understand the economic relations of people within their own nation and with other nations.

The curriculum guide, "Art Education: Kindergarten — Grade 12" (May 1963), made references to and recommendations for including the arts in daily living, personal surroundings, and architecture, particularly at the secondary level. The 1967 bulletin, "Approaches for Setting Up Art History and Appreciation Programs at the Secondary Level," emphasized and focused a research in the history of local community architecture and community growth as a part of the recommended program.

Under Title III ESEA, the Department of Education has participated in projects directed toward or involving environmental education. Two publications are noteworthy. One, "Outdoor Education in Connecticut," describes programs conducted by Project RESCUE, Project OUTDOORS in Manchester, and C.O.P.E.S. (the Connecticut Outdoor Projects in Educational Services). The other publication is entitled *Social Studies Concepts and Generalizations — A Framework for Curriculum Development.*

This work, an outgrowth of Project DISCUSS, includes a number of topics concerned with environmental education under the headings of the various social science disciplines.

Between 1968 and 1970, the ecology program conducted by the Schools of Wilton, Connecticut, based their sensory perception and aesthetic response on an art curriculum bulletin entitled, *Perceptual Awareness, Aesthetics, and the Primary Child*. The Area Cooperative Educational Services provides consultative services to schools in its region for lectures in environmental education. The Talcott Mountain Science Center is offering instruction in geology and ecology. Nature centers and museums are providing services to 101 out of 169 Connecticut school districts. A bibliography of environmental education materials has been sent from the Department to all science and social studies chairmen and supervisory personnel.

A workshop on elementary science sponsored by the American Association of School Administrators and the American Association for the Advancement of Science with the cooperation of the Department included environmental materials. A conference on "New Directions in Environmental Education" took place in New Haven in 1970. This conference had representation from the Health Department, the Agriculture and Natural Resources Department, the Governor's Committee on Environmental Policy, the Conservation Commissions, and a student's group, as well as authorities in the curriculum development field.

The Bureau of Elementary and Secondary Education has developed curricular materials for the junior high school. The topics for these materials were selected by a committee of science and social studies teachers. Activities, resource information, and films, etc., were drawn together by a writing team during the summer of 1970. The materials are currently in schools on a pilot basis.

In addition to these activities, the the Connecticut Department of Education is a member of a nine-state consortium developing curricular materials as well as evaluation instruments in environmental education. This consortium, known as the Northeast Environmental Education Developments (NEED) group, has adopted an interdisciplinary stance in its activities and is developing materials utilizing such new instructional methods as individualized audio-tutorial techniques.

Efforts in the area of evaluation include the development of an Environmental Awareness Inventory for use with 11th grade youngsters.

The Department is also currently working toward the development of a State Plan for Environmental Education.

Georgia

The Board of Education of the state of Georgia has an unusually long history of devotion to environmental education. For example, the Georgia Environmental Education Institutes for teachers are seven years old. They make use of two college centers and offer teachers three rigorous weeks of field and classroom experience. The system employs three environmental study areas in addition to local school sites: Ferbank Science Center, Kennesaw Mountain National Battlefield Park, and Okefenokee Swamp.

Local innovation has also contributed significantly to Georgia's environmental education effort. Atlanta, for instance, has developed a program whereby selected high school students whose progress is reviewed by a faculty committee, work on environmental study projects of their own as their total school effort for periods of twelve weeks. In a project developed in Savannah and funded under Title III, students and teachers jointly learn study techniques for tidewater habitats.

The Georgia Board of Education has even more extensive plans for future environmental education projects. The Board intends to reach the total population of Georgia through the implementation of an education model it is now developing. The Board has classified the total population into four target groups: 1) school-age children, 2) teachers, 3) formal adult, and 4) informal adult. Six areas have also been designated for development: 1) school curriculum, 2) education centers, 3) teacher education and higher education, 4) media, 5) non-academics, and 6) evaluation and research.

As part of its future program, the Board is recommending that environmental educational centers be situated along watersheds, and that these centers offer facilities for measuring the physical and chemical properties of water, for sampling air, and for providing weather teletype readouts.

The Board has further recommended that local school administrators encourage every class to make one environmental study trip each year, and has proposed that each shared service district designate an environmental education specialist. In addition, local schools are urged to establish day-use environmental learning centers. The Board is making plans to supplement such day-use centers with overnight facilities for 140 students.

The Board also plans to put more emphasis on teacher education in the future. In its effort to expand preservice and inservice education courses, the environmental education task force has formed a sub-group to study changes in teacher certification which new ecological concerns might make appropriate. In addition, the Board has sought to stimulate education through the communications media, such as the press, radio, and TV.

Finally, as a major step in the direction of all these activities, the Board has recommended a survey of currently operating environmental education programs in the state and has suggested that the Environmental Education Planning Committee be awarded quasi-permanent status.

Maryland

In January 1970, the Maryland State Board of Education resolved to initiate a planned program of environmental education in all Maryland elementary and secondary schools. An Advisory Committee was immediately organized by the State Department of Education and charged with developing a statement of beliefs, establishing long range goals, and recommending a set of specific actions to implement the Board's resolution. After slightly more than a year of meetings, involving the lay public as well as staff members of the State Department, the Committee submitted a detailed report to the Board; it was accepted in full and the Superintendent was instructed to follow through promptly on the Committee's recommendations.

Among the Report's many suggestions, the following stand out:

Environmental education will be given high priority in Maryland during the next five years at all levels of education.

In cooperation with local school districts, the State Department of Education will construct a curricular framework for a comprehensive environmental education program.

The State Department will seek to identify and evaluate available materials and will attempt, whenever feasible, to develop new instructional materials for studying the environment.

School site standards will be revised so that all future sites fit properly into their natural surroundings and that schools and their grounds are so designed and landscaped that they constitute models for environmental study.

Regional centers will be established in strategic sectors (urban, maritime, rural, mountainous) of the State to provide live-in experience for children as well as locales for teacher training and the production of curricular materials.

Environmental education will be integrated with current teacher education programs at the State university and State colleges.

Steps have already been taken to implement several of these recommendations. For example, school officials have met with Maryland Forest and Parks people to begin planning for the environmental learning centers in Maryland parks. The Multi-State Conference, of which this Report is the record, was organized and directed by personnel of the State Department as part of its effort to study intensively various strategies for teaching the environment. Further, 10,000 copies of a booklet — *Environment and Education: To Save One, We Need the Other* — a cogent brief for environmental education in the State, has been published and distributed to every school in Maryland.

Missouri

Like other contributors to the conference, the Missouri State Department of Education has laid a solid foundation for effective environmental education but is still at work on the superstructure. At the time the Missouri report summarized here was written, the State Department of Education and the State Department of Conservation had already worked together four years to create a Statewide Advisory Committee for Environmental Education. This Committee has made preliminary proposals for the development of a substantial program. It has recommended, for instance, interdisciplinary environmental education from kindergarten through the twelfth grade. It has also proposed a seventh grade Environmental Science course and a Senior High School advanced course. Realizing that any meaningful program of student education must be preceded by a program of teacher education, the committee has developed plans for inservice training of teachers.

The activities of the Statewide Advisory Committee have been supplemented by the Arts and Humanities Division of the State Department of Education, which has devoted a section of its Junior High Allied Arts Guide to the environment. Furthermore, the State Department of Education has assigned an individual halftime to Environmental Education. His major responsibility is reviewing environmental proposals.

Unfortunately, the committee's proposal for environmental education, as embodied in Public Law 91-516, was not funded during fiscal year 1971-72. When such funds become available, the committee recommends that an environment section of the State Department of Education be created under the Curriculum Division, and that the section be staffed with a Director, consultant, and secretary. The function of this group would be to develop plans for a total program of environmental education along the lines proposed by the committee; i.e., an interdisciplinary approach to the subject from kindergarten through the twelth grade, supplemented by a seventh grade environment course and an advanced course in high school. The committee also has recommended that this body develop an interdisciplinary inservice training program for teachers which would include audiovisual demonstrations. Finally, the committee suggested that its successor collect information and materials to be made available to local schools, and that it assist in developing curriculum coordination units.

Oregon

Since 1958, the Oregon State Department of Education has had a Workshop committee functioning to improve environmental and conservation education. The committee established Oregon's first Outdoor School in 1959. With the help of the Oregon Game Commission, the U.S. Forest Service, and the U.S. Conservation Service in providing instructors and consultants, 194 sixth graders received instruction at the school in 1961. In 1966, the Committee recommended that a special consultant position in Conservation and Outdoor Education be established. Although this position has been established, it has not yet been funded. Nevertheless, the Committee has gone ahead with the development of a Regional Outdoor Education Center in Portland. The Committee has established the official position on ecological education that it is "not a separate area of study, but rather a subject that can be illustrated and emphasized within existing courses."

In its unflagging effort to aid local school districts in the implementation of its goals, the Committee has developed two publications of great importance: *The Handbook of Environmental Encounters* and *Environmental Education for the State of Oregon.*

The Committee continues to work on developing guidelines for local school districts, training local educators to train others, and providing a full-time consultant. The Committee has outlined four areas for future action: 1) teacher training, 2) education facilities, 3) community education through community college, and 4) public understanding and support. The committee is also sponsoring the development of fifth year graduate programs of environment study for teachers, development of an environmental education major, and the establishment of a state environmental education center.

Utah

Like most states, Utah has not developed its program for ecological education in a vacuum. In devising a program to meet rather recently recognized needs, the State Education Agency of Utah has been building on related programs previously in existence, namely, its program of conservation education. A major component of ecological concern is the rapid depletion of natural resources. Since 1956, the Utah State Education Agency has been served by a Conservation Council which gives direction to efforts in conservation education. In 1965, however, state resource management agencies, pleading for greater effort in conservation education, stimulated the organization of a statewide environmental education committee to extend the work of the conservation council.

The Environmental Education Committee formulated a statement of objectives and organized a series of Resource Agency Seminars intended to bring together local educators and resource agency personnel. Since 1966, over 500 educators have participated in inservice workshops on environmental education sponsored by the Environmental Education Committee and the State Board of Education. Teacher education, a major preliminary step in the implementation of any school program, has also been furthered by two-day preservice workshops for elementary school teachers and a procedure called "the ten-minute walk," developed to familiarize the teacher with the environment of his school.

The Environmental Education Committee has also served as a resource agency helping local school districts to develop ESEA Title I and Title III proposals. For instance, the Committee also co-sponsored a project titled "Economics of the Local Environment."

In addition, the Committee has been active locating suitable sites for resident camps and outdoor study areas, as well as compiling an environmental education bibliography, and preparing a draft of a school site development manual stressing the requirements of a site to make it useful in environmental education.

Other activities of the Committee have included producing a natural science film series on flora, fauna, and the geology of Utah; participating in PELT (Providing Environmental Literacy Through TV); and participating as a member of the Western Regional Environmental Education Project ESEA Title V, Section 505.

The Environmental Committee of the Utah State Board of Education has long-range plans of considerable magnitude as well. The Committee intends to develop a state master plan for environmental education. The master plan will be directed toward educating teachers, students, and the public. It intends to develop regional procedures for preservice and inservice teacher education, with the help of a federal grant, and to originate a program of real life learning experiences so that it can provide schools and districts with useful learning resources.

Virginia

The Virginia State Department of Education has been active for two years implementing the objectives established by the Ecological Education Committee it appointed in March 1970. At that time the Committee designated the following objectives: to assess the needs of the local school divisions, to review current instructional materials, to provide state and regional workshops, to provide consultative services, and to cooperate with state and local groups in encouraging an interdisciplinary program of ecological study.

The developing program in Virginia is perhaps most remarkable for its diversity. Almost every subdivision within the system has developed or is developing the means to bring ecological education into its course of study. Within the Division of Vocational Education, for instance, the agricultural curriculum committee has revised its manual, *Forestry in Agricultural Education*, and prepared ten filmstrips coordinated with it. The committee has also prepared a curriculum guide to the course, *Conservation and Forestry*, a course now being offered in 25 Virginia schools. Educators in the Division of Business have also made rigorous efforts to include ecological study within their program by, for instance, introducing a section on "Business and Ecology" into the General Business course.

The Trade and Industrial Education Division is equally dedicated to making its program ecologically sound. To this end it introduces its students to the study of the ecological consequences of our use of natural resources. Between 1969 and 1971, some 250 Industrial Arts teachers attended workshops which prepared them to use an Industrial Arts curriculum design focusing on environmental education. Students of this curriculum are challenged to apply technology to the solution of environmental problems.

The Division of Elementary and Special Education is also hard at work integrating ecological study into its programs. At the time the report summarized here was written, work was going forward on an elementary science guide for kindergarten through the seventh grade. The guide, which contains a section on "Man and Technology," is being designed to help the student become "aware of his role in the wise use of natural resources."

In addition to encouraging these activities, the Ecological Education Committee has been recommending textbooks which stress conservation, selecting children's books on conservation for school libraries, reviewing and evaluating available audio-visual materials, assisting in filmstrip development, assisting localities in the development of curriculum materials, directing an inservi workshop, and reviewing the Annual Virginia Wildlife Essays submitted by 5th, 6th and 7th graders.

In the secondary schools of Virginia, also actively developing their program, the Ecological Education Committee has encouraged the use of outdoor laboratories by science classes. Physical Science classes are taught to measure the amount of dissolved oxygen in water and the presence of particles in the air. The Science Education Service of the state has developed outdoor laboratories and inservice training programs for secondary school teachers, and has selected environmental library materials.

Wisconsin

The state of Wisconsin, through its Board of Education and affiliated agencies, has been hard at work developing a viable program of environmental education for many years. In pursuit of its objectives, the Board of Education four years ago hired an environmental specialist as consultant and charged the Environmental Education Council with developing a state plan of action.

In response to its charge, the Council has developed a system of conservation camps and has acquired outdoor teaching facilities. A course developed through the Council, "Ecology and Human Values," is now being field tested in four schools in Milwaukee. An asset to the Council has been the presence of the University of Wisconsin. The University has developed a natural resources education major, graduates of which are qualified to teach courses in environmental education. The University's Research and Development Center, also active in the area of environmental education, has identified 128 concepts central to the teaching of environmental science.

In addition to its achievements to date, the Council has also proposed a wide-ranging master plan for future environmental education in Wisconsin. The Council feels that for maximum effectiveness environmental education must pervade the entire kindergarten through twelfth grade curricula. The Council has developed a program of teacher education in three stages as well as a four-part curriculum development plan. The Council is stressing an effort to integrate environmental concepts into existing curricula on a multi-discipline level. As a step in this direction, the Council has recommended that an inter-disciplinary issues and action course be developed at the high school level.

The Council has also recommended the establishment of an open-ended grant program in which the students write mini-proposals for their own environmental study projects and which are funded in their work by a city-wide student council organization. Another innovative suggestion is a citywide student-run environmental newspaper.

Wisconsin also plans outdoor lab projects. Proposed or underway are an urban environmental studies center, demonstration farm, mobile laboratories, expanding school forest program, ecological camping program, and field trip experiences. The state is providing assistance to local school districts for relevant programs that are directed toward development of positive attitudes and values rather than heavy emphasis on cognitive learning.

Multi-state Conference on Environmental Education

Annapolis Hilton Hotel
Annapolis, Maryland
November 8, 9, and 10, 1971

Participants

Connecticut

Dr. Arthur Soderlind, *Social Studies*
Dr. Robert Saunders, *Arts and Humanities*
Dr. Sigmund Abeles, *Science*

Georgia

Mrs. Gwen Hutcheson, *Social Studies*
Mrs. Juanita Abernathy, *Arts and Humanities*
Mr. Dallas Stewart, *Science*

Maryland

Dr. James W. Latham, Jr., *Science*
Dr. Thomas E. Rowan, *Environmental Education Project*
Dr. George Crawford, *Curriculum*
Dr. Harold Lott, *Arts and Humanities*
Mr. James Addy, *Social Studies*
Mr. Victor Kotulak, *Arts and Humanities*
Mrs. LaDonna Scott, *Secretary*
Mrs. Martha Jablow, *Staff Writer*

Guests — Maryland

Mr. Fred Spigler
Educational Advisor to the Governor

Mr. Spencer Ellis
Director of Forests and Parks

Dr. James A. Sensenbaugh
State Superintendent of Schools

Dr. Fred J. Brown, r.
Associate State Superintendent of Schools

Dr. T. K. Muellen
Assistant State Superintendent of Schools

Mrs. Mildred Sowers
Director of Curriculum Development

National Science Foundation
Dr. Theodore Reid
Dr. Walter Gillespie

National Education Association
Mr. Joseph T. Howard

U.S. Office of Education
Mr. Paul Cromwell

District of Columbia Public Schools
Mr. Reuben Pierce

Missouri

Mr. John Lucas, *Social Studies*
Dr. Richard King, *Arts and Humanities*
Mr. John Hooser, *Science*

Oregon

Mr. James Ylvisaker, *Social Studies*
Mr. Frank Mazzio, *Arts and Humanities*
Mr. Ray Thiess, *Science*

Utah

Mr. Allen Bauer, *Social Studies*
Mr. Charles Stubbs, *Arts and Humanities*
Mr. LeMar Allred, *Science*

Virginia

Mr. Clyde Haddock, *Social Studies*
Dr. Clarence Hesch, *Arts and Humanities*
Mr. Franklin Kizer, *Science*

Wisconsin

Mr. Mike Hartoonian, *Social Studies*
Mr. Earl Collins, *Arts and Humanities*
Dr. Kenneth Dowling, *Science*

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